

Choosing green and blue over grey to improve cities' climate resilience

World Green Infrastructure Network EU Chapter
Position Paper on the European Climate Resilience Framework



The urgency: cities at the frontline of climate impacts

Climate change is making climate patterns increasingly unstable, leading to more frequent and severe extreme weather events, and making full preparedness all the more challenging. Urban areas are particularly exposed to heatwaves, flooding, droughts, and water scarcity, while continued urbanisation stresses people, assets, and economic activity in cities.

According to the United Nations, global urban populations are expected to continue rising sharply, with around 5 billion people living in cities by 2030 and around 68% of the world's population projected to live in urban areas by 2050.¹ In Europe, cities are therefore at the frontline of climate impacts and adaptation efforts.

Scientific evidence demonstrates that nature-based solutions, including green roofs and walls, reduce urban heat island effects, manage stormwater, restore the natural water cycle, and deliver multiple co-benefits.² For example, in cities, people's safety and physical and mental health are directly linked to the quantity and quality of available blue and green infrastructure.³ Moreover, there is a robust body of evidence about the positive impact of urban blue and green infrastructure on biodiversity and energy savings at the building and the municipality level.⁴ Nature is therefore not a complementary option, but a foundational pillar of urban climate resilience. As a result, WGIN strongly believes that nature-based solutions should be a central element of the upcoming European Climate Resilience Framework.

Growing impacts: the human and economic costs of inaction

The impacts of climate change are already exacting a heavy toll on Europe's society and economy. Between 1980 and 2020, the European Environment Agency reports between 85,000 and 145,000 fatalities linked to weather and climate related events.⁵ Between 1980 and 2024, total economic losses amounted to approximately EUR 822 billion (in 2024 prices).⁶

Looking ahead, Member States and the private sector are expected to need to invest around EUR 70 billion per year until 2050 in climate adaptation to reduce exposure to increasing hazards and improve resilience.⁷

Urban flooding and extreme weather already cause significant business disruption. In 2025 alone, such events generated at least EUR 43 billion in short-term economic losses across the EU, with impacts projected to reach EUR 126 billion by 2029. These figures include indirect costs such as business interruptions, lost production, and supply-chain disruptions. All of these substantial costs could be partially countered in cities by the implementation of blue and green infrastructures.

¹ [68% of the world population projected to live in urban areas by 2050, says UN | United Nations](#)

² [EFB Bugg_GSG Benefits Green Buildings final 2025.pdf](#)

³ [Green and blue spaces and mental health: new evidence and perspectives for action](#)

⁴ [Policy Guidance: Making European Cities healthier, more resilient and beautiful - World Green Infrastructure Network](#)

⁵ [news-39042-economic-losses-and-fatalities-from.pdf](#)

⁶ [Economic losses from weather- and climate-related extremes in Europe | Indicators | European Environment Agency \(EEA\)](#)

⁷ [EU needs to invest €70 billion per year in climate adaptation up to 2050 - Climate Action](#)

Restoring the natural water cycle as a priority

In most European cities, the natural water cycle is broken. As more and more impermeable surfaces were installed, and stormwater was diverted to pipes and culverts, the management of water became an increasing challenge for urban areas, leading to expensive and energy-intensive water management processes. In addition, as extreme droughts or heavy rainstorms are becoming more and more frequent, the restoration of the natural water cycle in cities must be an essential aspect of the Climate Resilience Framework. It must recognise and properly define the concept of sponge cities,⁸ and introduce measures to repair the natural water cycle, continuing the goals of the Urban Wastewater Treatment Directive. Such actions will enable water not to be seen as a risk to be managed but as a valuable resource for the future, essential to the circular economy and long-term urban competitiveness.⁹

Learning from nature

Cities' vulnerabilities to climate change can be significantly strengthened with the installation of nature-based solutions. Above their benefits in terms of water management, reduction of urban temperatures, or improvement of inhabitants' health, they also represent a cost-effective first line of defence against climate change. Indeed, by acting as mitigators of weather-induced impacts, they provide a resilient solution, without needing to build a large amount of costly (and greenhouse gas intensive) grey infrastructures. In the long-term, the economic benefits from these solutions are therefore strong, making green not only more resilient, but cheaper than grey, from a societal perspective. Therefore, the Climate Resilience Strategy must support municipalities choosing green solutions over grey ones in their adaptation actions.

Start with the implementation of existing EU legislation

A successful Climate Resilience Strategy must first and foremost ensure the implementation of the set of directives and regulations regarding nature, water and energy adopted in the last political mandate. If fully and correctly implemented, they can significantly enhance climate resilience in urban areas.

Central among these is the Nature Restoration Regulation (NRR), notably its urban greening provisions under Article 8, which establish a clear obligation to halt and reverse the loss of urban green spaces. Other key instruments include:

⁸ [How 'sponge cities' can help protect against flooding. | World Economic Forum](#)

⁹ [New Position Paper "Water as a Strategic Resource for the Circular Economy Act and Competitiveness" - Water Europe](#)

- »»» the Urban Wastewater Treatment Directive, which requires local authorities to prioritise green and blue infrastructure when designing their integrated wastewater management plans.
- »»» the Energy Performance of Buildings Directive (EPBD), which requires Member States to consider green roofs when developing plans for solar photovoltaic deployment on buildings.
- »»» the Energy Efficiency Directive (EED), which mandates energy savings measures by local authorities and supports integrated approaches such as the water–energy nexus.

Ensuring the full, prompt, and correct implementation of this existing framework must be everyone's first priority. Regulatory certainty provides direction to policymakers, public authorities, insurers, investors, and solution providers alike. Conversely, transposition delays, legal uncertainty, or deregulation would prevent effective action, slow investment, and undermine Europe's climate resilience objectives. In that context, the upcoming European Climate Resilience Framework should first and foremost reconfirm the commitment of the European Commission to the full implementation of these pieces of legislation, and its willingness to act in case of delay in the transposition or delivery of Member States' goals.

The European Climate Resilience Framework could also provide additional guidance for Member States, platforms to exchange on best practices, decision support frameworks for nature-based solutions and technical assistance at EU level to support Member States and local authorities in their implementation efforts.

Strengthening resilience across the EU: the case for new EU legislation on climate resilience

While existing legislation provides a good foundation, it is not sufficient on its own. A dedicated European Climate Resilience Framework through new EU legislation is needed to embed climate adaptation and resilience systematically across policies and sectors .

As the European Chapter of the World Green Infrastructure Network, we would call for this framework to:

- »»» Establish a mandatory “resilience-by-design” principle across EU planning, public spending, procurement, and key sectoral policies. For urban areas, this would translate into the inclusion of resilience consideration in urban planning and decision making in cities.
- »»» Develop an EU-level definition of a climate-resilient city (i.e. a resilience standard) and acceptable levels of climate risk, adaptable to national and regional contexts.
- »»» Require climate risk assessments for urban areas to identify vulnerabilities, assess gaps to resilience standards, and define sectoral pathways to bridge these gaps. Such pathways would include specific assessments of the potential deployment of blue green infrastructure on existing buildings and impervious surfaces.
- »»» Address the improvement in urban climate resilience at neighborhood scale, beyond jurisdictional or property boundaries as climate change impacts the full built environment.

- »» Ensure coherence by proactively seeking dialogue and consistency across policy makers and stakeholders working in buildings, energy, water, health, nature restoration, and spatial planning policies.
- »» Urban areas, buildings, and critical infrastructure - where people live and work and which increasingly host decentralised energy systems - should be prioritised in climate resilience efforts. As 85–95% of today's building stock will still exist in 2050, renovation policies must also redefine what it means to “renovate” a building to ensure it becomes future-proof and climate-resilient.
- »» Allocate sufficient resources for a strategic focus on raising awareness initiatives, educational efforts and skills development across Member states.

Think systemic: the economic case of urban green infrastructure and sponge cities

Nature-based solutions and, in particular, blue-green infrastructure are essential to future-proof local authorities. The concept of sponge cities - aimed at restoring the natural water cycle through infiltration, retention, and detention of rainwater - must become an integral part of climate resilience by design in urban areas, as already reflected in the European Water Resilience Strategy.

All new and existing buildings, where technically feasible, should be equipped to manage stormwater locally, namely via the integration of green infrastructure on buildings or in the near-facility. This approach prevents flooding, reduces the need for costly grey infrastructure, delivers energy savings (including those linked to the reconstruction works for grey infrastructures), and provides multiple environmental and social co-benefits.

Investing in green roofs and walls is not only an environmental and social necessity, but also an economically sound choice. These solutions reduce risks at source by preventing damage rather than repairing it after extreme events occur. They lower public expenditure, reduce insurance losses, and support economic continuity in cities. In the paragraph titled “Growing impacts: the human and economic costs of inaction,” we present recent data on the economic consequences and business disruptions caused by climate change, and explain how these substantial costs could be partially mitigated in urban areas through the implementation of blue and green infrastructure.

Scaling up the green infrastructure sector would strengthen Europe's industrial base, support SME growth, create local jobs, and enhance Europe's competitiveness.

Plan today, deliver tomorrow: a sound governance for resilience

Climate resilience and adaptation plans are essential tools at EU, national, regional, and local levels. Granular plans at municipal level are particularly important to reflect local climate risks and geographical specificities, and plan solutions to tackle these vulnerabilities accordingly.

A European Climate Resilience Framework should require Member States to set goals to improve the adaptation and resilience of their urban areas and, in coordination with local authorities, prioritise vulnerable geographical areas and vulnerable population groups. This is crucial to maximise the impact of public investments and put vulnerable and disadvantaged people first in climate adaptation efforts. To achieve these goals, the Framework must incentivise and help cities to install building-integrated green infrastructure, also as a way to provide more access to green spaces for vulnerable groups.

Member States should ensure that the achievement of these targets is supported by adequate financial and technical assistance, particularly for municipalities and citizens with limited capacity and expertise.

Partnerships and incentives to unlock investment

To accelerate deployment of climate resilience solutions, including nature-based solutions, the European Climate Resilience Framework should support:

- »»» The creation of EU-level platforms for sharing information and data on high-quality climate hazard, exposure, vulnerabilities.
- »»» The collaboration of all relevant actors, public authorities, solution providers, academia, insurers, and financial institutions to share and co-design resilience and prevention initiatives and deploy solutions
- »»» Incentives for households, SMEs, and municipalities to invest in preventive measures, starting with nature-based solutions. Designing nature-based resilience and prevention initiatives is one of the most effective ways to reduce risk and increase insurability. In urban areas, close cooperation between local authorities, solution providers, and insurers is essential.

Conclusion: boost EU effort for mitigation and adaptation

As it is doing for climate change with the recent setting of the 2040 climate target, the EU has a unique opportunity to lead globally on climate resilience by placing nature at the heart of its response. Beyond mitigating climate change, Europe has the solutions to remain a liveable and water-secure society that manages water not as a problem but as a valuable resource. By fully implementing existing legislation - starting with the Nature Restoration Regulation - and complementing it with a strong, forward-looking European Climate Resilience Framework, the EU can protect citizens, strengthen cities, reduce economic losses, and support a competitive European green infrastructure sector.

The World Green Infrastructure Network (EU Chapter) stands ready to support the European Commission with practical and scientific expertise and solutions to deliver effective, nature-based climate resilience across Europe



Who we are

The World Green Infrastructure Network (WGIN) – EU Chapter represents providers of urban green infrastructure solutions, including green roofs, green walls, and broader nature-based solutions. Our members are European micro, small, and medium-sized enterprises (SMEs), academia and emerging professionals that design, deploy, and maintain solutions which make buildings, neighbourhoods, and cities more resilient to climate change. We are confronted on a daily basis with the need to design, deploy, and maintain solutions that prevent and reduce climate-related risks in urban areas.

Europe is a global technology leader in green and blue infrastructure solutions, supported by decades of applied experience, engineering expertise and market deployment. Our members are involved in proven, replicable success stories in which they deploy mature solutions with established technical performance and measurable benefits. Policymakers can rely on our sector. The knowledge base, supply chains, standards and implementation capacity are already in place – what is required now is regulatory clarity and strategic alignment to enable deployment at scale.



Annex: List of recommendations for the European Climate Resilience Framework

The World Green Infrastructure Network advocates for the following core elements to be reflected in the upcoming European Climate Resilience Framework:

- Set **water resilience as the core focus of the European Climate Resilience Framework**. For cities, this would entail the recognition and definition of the concept of sponge cities, and the introduction of measures to repair the natural water cycle in urban areas, continuing the goals of the Nature Restoration Regulation and the Urban Wastewater Treatment Directive.
- Include a strong dimension on **improving the climate adaptation and resilience of cities specifically**, given the multiple climate-related challenges they are facing.
- Ensure that the Climate Resilience Framework supports the **full implementation of the set of directives and regulations adopted during the last political mandate** that will have direct positive effect on climate adaptation and resilience, namely the Nature Restoration Regulation, Urban Wastewater Treatment Directive, the Energy Performance of Buildings Directive and the Energy Efficiency Directive.
- **Prioritise nature-based solutions** and favour green over grey solutions in the initiatives foreseen under the Climate Resilience Framework, also by providing rationale and scientific evidence on the added benefits of installing green infrastructures.
- Establish a **mandatory “resilience-by-design” principle** across EU planning, public spending, procurement, and key sectoral policies, develop an **EU-level definition of a climate-resilient city** (i.e. a resilience standard, link to the definition of a sponge city) and the acceptable levels of climate risk, and **require climate risk assessments for urban areas** to identify vulnerabilities, assess distance to resilience standards, and define sectoral pathways to bridge these gaps.
- Identify **green infrastructures**, namely green roofs and walls, as **essential solutions to improve cities’ climate resilience and adaptation** and reduce disparity between citizens in accessing green spaces. In addition, ensure that Member States provide comprehensive technical and financial guidance and assistance for cities and private owners to install green and blue infrastructure solutions.